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10/588,603

08/07/2006

Takeshi Hirabayashi

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EXAMINER

COHEN, STEFANIE J

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

04/01/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|---|--|
| Office Action Summary | Application No. 10/588,603 | Applicant(s) HIRABAYASHI ET AL. | |
| | Examiner STEFANIE COHEN | Art Unit 1793 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 December 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 7 and 9-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 7 and 9-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 7, 9, 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida et al (6083868) in view of Wachter et al (5346875) and evidenced by Beckmeyer et al (5753581).

Yoshida, table 2 example 32, teaches a method of producing a heat resistant catalyst support comprising alumina, titania and ceria.

It would have been obvious to one of ordinary skill in the art at the time of the invention that silica could be substituted in for titania because Yoshida, col. 3 lines 9-12, teaches both titania and silica have the ability to be highly dispersed to form a composite, bonding force of a NO_x storage component to the catalyst support and improve the heat resistance of the composite.

Further, Yoshida, claim 2, teaches the ceria can be present in the catalyst as ceria sol.

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Although Yoshida teaches a method of producing a heat resistance catalyst support comprising a dispersion of alumina and silica sol and ceria sol, Yoshida does not teach a method to make a catalyst involving isoelectric points of each component.

Wachter, further teaches a method of manufacturing a fluid catalytic catalyst comprising the steps of:

- Providing an inorganic oxide sol having a measurable pH

- Measuring the isoelectric point of each component of the framework structure

- Measuring the pH of the inorganic oxide sol

- Matching the isoelectric point of each component of the framework structure to the pH of the inorganic oxide sol

- Combining in solution the inorganic oxide sol with each component of the framework structure

- Drying the combined suspension

The inorganic sol can be considered the alumina/silica sol and the framework structure can be considered the ceria sol as taught by Yoshida.

Wachter, col. 3, further teaches the isoelectric point of the framework structure component is matched to within 2 pH units of the inorganic oxide sol.

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Wachter, col. 5, teaches the isoelectric point can be modified by adding to specially adsorbing ion such as sulfate or phosphate to a slurry of the framework structure. Wachter, example 5, teaches adjusting the pH with sulfuric acid.

Wachter, col. 7 lines 40-45, teaches when the framework structural component and the sol have been properly mixed the combination is dried to form the catalyst.

It would have been obvious to one of ordinary skill in the art at the time of the invention that preparing a solution after the isoelectric points were measured and adjusted would result in the same product as stated in the instant claims.

It is known in the art that the isoelectric points of ceria=6 and alumina=8-9 as referenced by Beckmeyer (col. 2 lines 57-60) and the isoelectric point of silica=2 as referenced by Wilcox (5492870).

Beckmeyer, col. 2 lines 53-67, teaches impregnating with a positively charged ion or radical at a pH around 7 will result in most of the impregnated material being associated with ceria. This is because ceria will have a negative surface charge while alumina will carry a positive surface charge and therefore not attract the positively charged metal radical.

It would have been obvious to one of ordinary skill in the art at the time of the invention to ensure ceria and alumina have isoelectric points of 6 and 8-9 respectively because Beckmeyer, cols. 3 and 4, teaches when impregnated a catalyst with platinum

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group metals (PGM) it was verified that much more PGM is associated with the ceria as opposed to alumina when impregnated at a pH of 7 and therefore improved the performance of the catalyst.

Further, it would have been obvious to one of ordinary skill in the art at the time of the invention to substitute the silica as taught by Wilcox in for alumina as taught by Beckmeyer which would result in difference of 4 in the isoelectric points and further ensure the all of the PGMs would be associated with ceria as opposed to silica.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the method as taught by Wachter with the Yoshida, example 32, composition because Wachter, abstract, teaches this method results in a catalyst product having a controlled pore size and is extremely durable.

Further using the method as taught by Wachter with the Yoshida, example 32, composition would result in a metal oxide particle having a core where the total molar number of alumina and silica is larger than the molar number of ceria and a surface layer where the molar number of ceria is larger than the total molar number of alumina and silica.

Regarding claim 9, Yoshida, table 2 example 32, teaches a (Al+Ti): Ce molar ratio to be 7:4.

It would have been obvious to one of ordinary skill in the art at the time of the invention that silica could be substituted in for titania because Yoshida, col. 3 lines 9-12,

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teaches both titania and silica have the ability to be highly dispersed to form a composite, bonding force of a NO_x storage component to the catalyst support and improve the heat resistance of the composite.

Regarding claim 10, Wachter, col. 5 lines 60-68, teaches when the framework structure includes a crystalline tetrahedral framework oxide component, it is preferable that the isoelectric point of the crystalline tetrahedral framework oxide component be matched within about .5 pH units of the inorganic oxide matrix sol.

Regarding claim 11, Yoshida, example 1, teaches after the catalyst support powder is dried, the powder was mixed with a solution of platinum dinitrodiamine nitrate, stirred and dried thereby loading platinum to obtain a catalyst powder.

Yoshida, col. 1 lines 10-25, teaches this catalyst can be used to purify automotive exhaust gases.

Response to Arguments

Applicant's arguments, filed 12/19/2008, with respect to the rejection(s) of claim(s) 1, 2, 5, 7 and 8 under Ogura, Wright and Pinnavaia have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Yoshida, Wachter and Beckmeyer.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to STEFANIE COHEN whose telephone number is

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(571)270-5836. The examiner can normally be reached on Monday through Thursday 9:3am-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Melvin Curtis Mayes can be reached on 5712721234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Stefanie Cohen

3/5/2009

SC

March 29, 2009

/Melvin Curtis Mayes/
Supervisory Patent Examiner, Art Unit 1793

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